
III. *Part of a Letter from Mr* Anthony van Lewenhoeck, *F. R. S. containing his Obſervations on ſome* Animalcula *in Water, the diſſolution of Silver,* &c.

Delft in *Holland*, Feb. 5. 1703.

ABout the latter end of *July*, ſtanding on the Bank of the *Canal* that is before my Houſe, and obſerving the Water, which gently flows thro' our Town, and which is very clear, and almoſt of the colour of the *Maeſe* Water, I ſaw ſomething ſhining in it, and being deſirous to know what it was, I took a Glaſs Tube of almoſt a Foot length, and of a Fingers breadth, and tying a String about it I let it down into the Water perpendicularly till it was quite full.

Looking upon this Water with a Microſcope, I obſerved ſeveral ſorts of Animalcula Swimming therein, ſome of which I don't remember I had ever met with before.

I view'd this Water ſeveral times in one day, but could not find out the ſhining Matter which I had ſeen in the Canal.

On the 4th of *Auguſt* I made my obſervations again, and then I could ſee in 8 or 10 places ſeveral ſmall Particles ſticking ſo faſt to the ſides of the Tube, that altho I put the ſaid Water into a gentle motion, I could not remove them.

This induced me to view the ſame with my Microſcope, and then I could plainly ſee thoſe Particles, repreſenting a large Bough or Branch of a Tree, with a great number of Sprigs about it.

Moſt of theſe Branches were faſtned with their Stems to the ſides of the Tube, and ſeem'd to ariſe out of a very ſmall Particle of Matter that was likewiſe ſo faſtned.

That

That I might be farther ſatisfied herein, I took an other Tube that was longer and broader than the firſt, and fill'd it with the ſame Water, having firſt rinced it once or twice.

I viewed this Water alſo ſeveral times, after it had ſtood 30 hours in the Tube, and again diſcovered the ſame ſort of Boughs as compleat and perfect as if you were to ſee the ſame with your naked eye on a Tree, and amongſt others one in ſuch a poſition, as if the thick Branches from whence the reſt proceeded, lay juſt againſt my Eye.

Before this laſt Particle I placed a Microſcope, with a deſign to obſerve from time to time whether it would encreaſe in bigneſs.

After the ſpace of ſix hours I could not find that it was grown any bigger, and I obſerved that the ends of the Twigs, which were about twenty, were laden with little tranſparent Bubbles, whoſe Diameters were thrice as big as the extreme parts of thoſe Twigs.

Now having likewiſe obſerved about the ſaid Twigs a ſort of Tranſparent Animalcula of the ſame ſize with thoſe Bubbles, I did ſuppoſe that the before-mentioned round Bubbles were the ſame with thoſe Animalcula that had taken their ſtation on the ends of the Twigs; and I was confirm'd in that opinion when I perceiv'd the next day in the morning, after that the Water had been 48 hours in the Glaſs Tube, that moſt of theſe round Bubbles were off the Twigs, and that a very few of the Animalcula were got upon the Twigs, and remain'd there immovable, whilſt I made my obſervations.

Twelve hours after this I could not ſee that the foreſaid Branches were grown larger; but I then obſerved that ſeveral of the ſmall Twigs were again inveſted with round Bubbles, and an Animalculum that was about fifty times as big as one of the Bubbles, was running on one of the Branches; and foraſmuch as the end of one of the Twigs, where that Animalculum had been, was again laden with the ſaid Bubbles, I concluded, tho I had no ocular proof of it, that the ſaid Animalculum had dropt her young ones there.

On the 6th of *Auguſt* I took another Glaſs Tube of above a foot long and an inch in diameter, one end of which was hermetically ſeal'd, that there might be no cauſe of ſuſpicion that theſe branches or twigs proceeded from the Cork; and having rinced the ſame two or three times, I ſet it on my Deſk, and viewed it ſeveral times, but could perceive no Branches till after the Water had ſtood above 40 hours in the Tube; after which I took a Microſcope and faſtn'd it to the Tube, to ſee whether the Branches grew any bigger after the firſt diſcovery of them, but as nicely as I viewed them I could perceive no alteration.

Now I could ſee on the extream parts of the ſaid Twigs 3 or 4, or ſometimes 5 round Bubbles like Roſes by one another, which was a very agreeable ſpectacle, for when one of theſe Branches (which was only faſten'd to the Glaſs by its thickeſt end) came to be removed by that ſmall motion into which I put the Water, all the five ſmall Twigs were likewiſe put into motion, and the ſame motion was likewiſe imparted to the Bubbles, tho ſome of their Stalks were ſo exceeding ſmall that I could not ſee how they were joyn'd to the ſaid Twigs.

I pour'd out the Water very gently from the Glaſs Tube, with intention that the Branches which were faſten'd by their Stems only to the ſides of the Glaſs (whilſt their Twigs were kept in a continual motion by the Water) might lye along on the Glaſs, to the end that my Limner might draw them the better.

Fig. 1. A B C D E F Repreſents the ſaid Particle as it lies on the ſide of the Tube.

A. Shews you the Stem or Root of the ſaid Branch, and whereby it was joyned to the ſides of the Glaſs.

Here you may ſee what a vaſt number of Branches and Twigs there are in this ſingle Figure, which indeed appears irregular upon the Paper; whereas in the Water where they were unravell'd and could play free, it was a very agreeable ſight,

ſight, being in colour like Oak, and in ſeveral places beſet with round Bubbles, juſt as if they were compos'd of ſuch Particles.

G and D repreſent ſome of theſe Particles of the Figure of a Roſe, which ſeem to conſiſt of round Bubbles, as alſo H. tho the Stalks of them are ſo fine that I could not perceive them to be united to the main Branch, however when that mov'd they mov'd alſo.

As ſoon as the Water was pour'd out of the Glaſs Tube I immediately viewed the ſaid Branch, and between two of the Sprigs B D and B E, I ſaw two of the ſmall Animalcula ſwimming in the little Water which remained unexhaled amongſt the Twigs, and their Figure was like the Bubbles that were deſcribed by H. During theſe my obſervations I diſcovered an exceeding ſmall Particle breaking off from one of the Particles or Bubbles under the ſaid letter H. and preſently ſwum off with a ſmall motion, but the whole ſpace of its progreſs was not above a hairs breadth; the ſaid ſmall Particle was certainly an Animalculum, for I could plainly ſee it turn and wind it ſelf about; I obſerved a little motion alſo in another of theſe Particles or Bubbles, that I have ſaid before were like a Roſe, but that Particle remain'd ſtill entire.

On the ſides of the ſame Tube lay ſeveral other ſmall Branches, but they were not ſo perfect as the firſt Figure, and when the Water was pour'd out, they appear'd like Fig. 2. I K L and Fig 3. M N O.

What ſhall we ſay concerning theſe Boughs or little Trees? We can't imagine that they proceed from a Seminal Matter in the Water, but rather with ſubmiſſion to better Judgments, that they are compos'd of that Matter which ranging in ſmall Particles thro the Water, does by a kind of natural inclination cement or coagulate into one body; and this will not ſeem ſtrange to any one who has ſeen the like experiment in the fileing of Iron, for if you apply that part of the Iron that is filed and remains ſtill warm to the Filings, it will immediately attack the ſaid Fileings, and they ſhall hang down like a Chain from the Iron; nay, if you apply theſe Fileings to a Magnet, the Attraction will be much ſtronger:

Now I am ſpeaking of Inclinations, I can't forbear acquainting you, that I have ſeveral times for my diverſion diſſolved Silver in *Aqua fortis*, and as ſoon as I put the Silver into the Menſtruum have endeavour'd to obſerve the operations. and have always found a great number of Air-bubbles ariſing from the Silver, which before they were ſeparated from the Metal were as large as a common pins head, or as a grain of Sand.

Theſe Air-bubbles, as ſoon as they left the Silver, and in proportion to their mounting toward the ſuperficies of the Water, grew leſs and leſs, inſomuch that they did almoſt eſcape ones ſight, and preſently after vaniſht entirely, and this change happen'd uſually in the ſpace of three Pulſes: Some of theſe Air-bubbles laſted a little longer, others again, tho as big as a Pins head, burſt in pieces before my eyes, without leaving other and ſmaller Bubbles (part of themſelves) behind them.

For my farther ſatisfaction in this matter, I prepar'd a Glaſs Bottle, whoſe Axis was an inch and half large, of the ſhape as is delineated by Fig. 4. a, A B C D E F G, whereof A B C D repreſents the great Bowl or Globe, and A D E G the leſs, and F. the Bore or Orifice of the Glaſs.

This Glaſs I placed ſloping as in the Figure, after that I had firſt fill'd it a little above E G with *Aqua fortis* whilſt it ſtood perpendicularly; and then I put into it two grains of fine Silver which lay at the bottom of the Glaſs, in ſuch proportion as is expreſt in the ſaid Figure at B. whereby all the Bubbles proceeding from the Silver muſt aſcend perpendicularly to C; with this perſwaſion, that when the quantity of Air that was extracted from the Silver ſhould arrive at C. it would remain there, and that in proportion to the ſpace that the ſaid Bubbles ſhould poſſeſs there, ſo much of the *Aqua fortis* would be protruded from the greater Bowl to the leſs.

Now when I ſaw that but very few more Bubbles aroſe from the Silver, I could perceive very plainly that moſt of thoſe Air-bubbles that had been extracted, did not only grow leſs before they arrived at C, but were quite vaniſht.

Now that the Silver was viſibly united to the *Aqua fortis*, and had remain'd ſo 24 hours, there was as much Air in the Glaſs at C. as would fill the ſpace of 3 or 4 Pins heads; whereas there aroſe ſuch a vaſt number of Air-bubbles from the Silver during its diſſolution, that I was amaz'd what was become of them, ſeeing they were in a manner vaniſht, without leaving any Traces behind them.

I caus'd the Air in C. to diſlodge out of the Orifice F. by raiſing the Glaſs perpendicularly, and then I threw in three times as much Silver, whereupon an unſpeakable number of Air-bubbles continually aſcended towards C. but were diſpatch'd before they could arrive at the top,and ſuch of them as were bigger, and held out till they came to C. did then burſt in pieces, without leaving any marks behind them, except always as much Air as would fill the ſpace of three or four Pins heads.

Furthermore,I put 30 grains of Silver into the ſaid Water, without obſerving any more remarkable difference, ſave that there remain'd at C. as much Air in bigneſs as an ordinary Pea.

In theſe my obſervations I have likewiſe taken notice, that the larger the Air-bubbles are,which ariſe from the Silver, the faſter they mount towards the top of the Glaſs; and this has place alſo I imagine in that air which the Learned call *Aer Subtilis*, *viz.* how much the larger the Particles of Air be that perſpire from our bodies, the faſter they aſcend; and ſo likewiſe in the deſcent of all heavy bodies towards the Earth; as for inſtance, take two Iron Balls, one of an Inch in diameter, and the other of 5 Inches, and let theſe two Iron Balls fall at once from a certain equal heighth, my poſition is, that that Ball whoſe Axis is 5 Inches, muſt cut thro a Column of Air 25 times greater than the Column of Air thro which the one Inch Ball paſſes ; this being granted, I ſay then, that as thoſe two Columns of Air thro which the Iron Ball muſt paſs, are as 1 to 25, ſo the Gravitation of the ſaid two Balls are as 1 to 125.

Now that Ball which being 125 times heavier, and paſſes thro a Column of Air that is but 25 times bigger than the other, muſt needs, I ſay, move quicker in its deſcent than the leſſer Ball, ſo conſequently muſt thoſe Particles (ſuppoſing them to be compos'd of the ſame Matter) that are biggeſt, firſt and ſooneſt perſpire thro our Bodies.

But to return from this digreſſion, having firſt weaken'd ſome of this *Aqua fortis* thus impregnated with Silver, I put a little of it in a clean Glaſs Tube, and now and then threw into it a little Copper of the bigneſs of a grain of Sand, and then viewing my Silver water with a Microſcope, I obſerved with a great deal of pleaſure, how the Silver in this clear Water was coagulated into ſuch bodies as are deſcribed by the above-mentioned Trees ; which Coagulation we may call an Inclination ; and that I may give you a better Idea of this kind of Coagulation, I caus'd the Painter to deſcribe a ſmall Particle of the Silver no bigger than a large Sand, *vid.* Fig. 4. P. Q. R. S. T.

I was amaz'd to ſee in a few ſeconds of a Minute, ſuch Coagulation of branched Particles (which even thro a good Microſcope were inviſible) ariſing from a ſeeming clear Diaphanous and Liquid Matter.

Now what ſhould occaſion ſuch a Coagulation, inſomuch that no Silver ſhall remain in the Water, is to me wholly inſcrutable.

From theſe Coagulated ſmall Silver Particles, my thoughts made an excurſion to the rich Silver Stone which comes to us in ſmall fragments from the *Weſt Indies*, and which the Virtuoſo's keep as Rarities in their Cabinets, of which alſo I have a little.

Now if we ſeriouſly conſider the Silver in that Stone, we ſhall alſo find that its Particles are coagulated in juſt ſuch branches as appear'd in the aboveſaid Water by the help of my Microſcope, from whence I am the more fully confirm'd in my hypotheſis, that when the parts of that Stone were a fluid ſubſtance, the Silver Particles were alſo mingl'd with them, and when the Stone came to conſolidate, the Silver alſo was coagulated in Branches juſt as we ſee it now lying in the Stone, wherewith it is ſurrounded, and as it were impriſon'd; from whence ſeveral have conceited that in proceſs of time the Silver grew in the ſaid Stone.

In the *Philoſophical Tranſactions* No 243. *p.* 298. I obſerve that Sir *Robert Southwell*, a Member of the *Royal Society*, had acquainted that Body, that he had ſeen a Gold Ducat beaten very thin, and then diſſolv'd in two Ounces of *Aqua Regia*, into which was ſteept a Linnen Rag and then dried, and then ſteept again, and as often dried, till it had ſuckt up all the ſaid Water; after which they burnt the Cloath to Tinder, and ſo gilded the Silver, by rubbing it with the Aſhes or remaining matter of the ſaid Linnen.

I took a piece of Gold and threw it into a proportionable quantity of *Aqua Regia*, in the diſſolving of which I ſaw Air-bubbles aſcending in like manner as I ſaid before of the Silver.

After a little time I took ſome of the *Aqua Regia* thus impregnated, and laid it on a clean Glaſs, to obſerve, after the mingl'd Salts were coagulated, what Gold Particles I could diſcover therein.

When it was fair warm weather the Salts were for the moſt part coagulated, but in ſo many ſeveral ſorts of Figures that they were hardly to be accounted for, ſometimes they repreſented an exact Hexangular Figure, by and by the very ſame Figures were no leſs irregular; the occaſion of which was, as I conceive, becauſe the Coaleſcence of new Particles was not equal on every ſide; but that which was the moſt remarkable was, that upon theſe Salt Particles, that were as tranſparent as yellow Cryſtal, there lay other Salt Particles of a fine Gold colour, and ſometimes they appear'd

to

to me as if theſe fine Gold colour Salts were ſhut up in the other ſalt Particles, which caus'd a very agreeable Phœnomenon; but when the weather grew damp and moiſt, all the Cryſtal Salts were melted, and the Gold-colour Salts were mixt with the common Particles.

I took another little piece of Gold that had been workt by a Goldſmith, and having beaten it very thin, I put it into the ſame Glaſs where my other Gold had been, with *Aqua Regia*, and obſerv'd that a white Subſtance was ſeparated from it and ſubſided in the bottom of the Glaſs; for we know that as *Aqua Fortis* diſſolves Silver, whilſt the Gold eſcapes untoucht, ſo *Aqua Regia* diſſolves Gold, without affecting the Silver at all.

Hence I infer, that that Gold was alloy'd with ſome Silver, which was the White Subſtance, ſeparated, as I ſaid before, whereas according to our Laws the Wrought-Gold ſhould conſiſt of 22 Carats.

The Piece of Gold that lay in the *Aqua Regia* would not be united with it; whence I concluded that there was too much Gold and too little Water, for I had made the Glaſs ſo hot that I could not bear it with my hand.

Moreover, I took a ſmall piece of Copper and put it into *Aqua Regia*, where a little Gold had been already diſſolved, and preſently obſerved that the *Aqua Regia* began to operate upon the Copper, as if it had lain in *Aqua Fortis*; the Gold alſo cemented with the Copper, but in much ſmaller Branches than Silver in *Aqua Fortis*; and I ſaw that the Gold coagulated ſo ſtrongly with the Copper, that the Water about the ſaid Copper was quite diveſted of its Gold colour; and after an hours time the Water was ſo impregnated with the Particles of the Copper that it aſſumed a Green colour, and then one might perceive with the naked Eye the Gold that lay about the Copper.

Again, I took other *Aqua Regia*, that was impregnated with ſo much Gold that it could diſſolve no more, and obſerved that the coagulated Salt-particles were of an extraordinary

traordinary fine Gold colour, and very agreeable to the ſight, being compoſed of exceeding ſmall Particles, and the Corners or Angles very regular.

I placed theſe Salts before my Microſcope, that I might impart to others alſo the diverting ſpectacle, and all that ſaw it own'd they had never in their lives ſeen ſo fine Gold; and it ſeem'd of ſuch a Figure and Texture as if it had been a Piece of Gold newly taken out of the Mines.

Now, in order to expoſe to view the Coagulated Salt Particles in their firſt Coalition, I put the ſaid Water impregnated on a clean Glaſs, and then caus'd part of it to run off the Glaſs again, that the remainder might lye as thin as poſſibly in the Glaſs without touching it, imagining that the ſaid Water lying thus thin, the Salt Particles might Coagulate the more regularly; and I obſerved afterwards that moſt of thoſe Salt Particles were hexangular, tho ſo exceeding ſmall that they did almoſt eſcape the ſight, and many of them were regular Hexangles. See Fig. 5. A B C Fig. 6. D E F Fig. 7. G H I Fig 8. K L M and Fig. 9. N O P.

Moſt of theſe Figures were as tranſparent as Glaſs, and all of them were ſurrounded with a Liquid Matter that was ſomething upon the Gold colour, the which Matter did not exhale, tho the weather was very warm and dry.

Moreover, I ſaw an unſpeakable number of Particles ſo exceeding ſmall that their Figure was not diſtinguiſhable, tho I did believe them to be Salt Particles likewiſe; the rather, becauſe I could not obſerve any of theſe ſmall Salts lying near the aforeſaid great ones, which thro the ſympathetical Inclination of homogeneous Bodies, I did conclude to be compos'd of a Congeries of ſmall ones.

I ſaw alſo other Particles that were not at all Pellucid, which I ſuppoſe were ſurrounded with ſo many Gold Particles, that they were not only of an irregular Figure, but alſo opake.

Many of theſe Salt Figures were more protuberant in the

Circumference than in the middle, and had alſo ſeveral Rings or Circumferences, which does ſtill the more confirm me in the opinion of thoſe ſecret Inclinations of like Bodies, and thus in their increaſe they preſerve the ſame Figure which the ſingle Salts had put on at their firſt Coagulation.

Into ſuch Water I alſo put a little piece of Copper, and obſerv'd that immediately the Gold had partly united itſelf to the Copper, but the *Aqua Regia* had not ſo much power over the Copper as to protrude out of its ſubſtance ſo many Air-bubbles, as it might otherwiſe have done if there had not been ſo much Gold therein ; the ſaid Water had thereupon aſſum'd a greeniſh colour, and all the yellow colour was turn'd into Coagulated Gold, inſomuch that one might with the naked eye diſtinguiſh the Gold from the Copper, particularly the extream parts of the little Boughs which were made by the Coagulated Gold, altho the ſaid Coagulated Gold conſiſted of Particles that were ſo very ſmall and minute, that they did not appear larger with the help of a good Microſcope than the ſmalleſt grains of Sand to the naked Eye.

When I weaken'dwith Rain Water the *Aqua Regia* which had been impregnated with a great deal of Gold, and then put into it a bit of Copper, I obſerv'd that the Gold in a ſhort time was coagulated or united with the Copper, and that the Water was turn'd to a light green:

I have alſo obſerv'd that the ſmall Twigs of theſe Coagulated Particles were not of a fine Gold colour, from whence I inferr'd that there was Copper blended together in them.

The ſaid *Aqua Regia* which had been impregnated with Gold, having remain'd ſome days in the Glaſs, I perceiv'd that where it was thickeſt,it was covered with a Film or Skin, and that moſt of the Salts when the Weather was not warm, nor the Sun ſhin'd, were diſſolv'd, and much more in Rainy Weather.

Moreover, I expos'd the Glaſs with the ſaid Water to ſuch a heat of the Fire that the Salts evaporated in Smoak, and that part of the Glaſs where there lay leaſt of the *Aqua Regia*, aſſumed a colour that was ſomething upon the red, but where the ſaid Water lay thicker together, we could not ſee the fine ſhining Gold with the naked Eye, but when we rais'd that Glaſs, where the Gold lay higher to the light than the Microſcope, I ſaw that the Gold Particles were not united with the other, but now and then Coagulated into Branches, and where the Gold Particles were not thus Coagulated they were ſo very ſmall, that how nicely ſoever I viewed them they eſcaped my ſight; and tho there lay together more than a thouſand Millions of theſe ſmall Particles, all of them did not make a body that was bigger than one ſingle grain of a large Sand.

Where this Matter lay thin and diſpers'd, I obſerved that the ſmall Particles thereof were ſuch ſolid and compact bodies, that did not admit of the leaſt Rays of Light; and where they lay ſingle I ſaw other Particles yet ſmaller, whoſe Bodies were more looſe, but I imagined theſe laſt to be ſome Particles of that Matter, which the *Aqua Regia* had left behind it.

Now after that the ſaid *Aqua Regia* had remain'd on ſome of the Glaſſes ſeveral days, and the Salt Particles for the moſt part were changed into a fluid Subſtance, I obſerved among ſeveral of the Coagulated Branches ſmall diſtinct Particles, which I fancy to be Gold, tho I could not for the ſmallneſs perceive the colour of them.

To ſatisfy my ſelf herein, I took a ſmall Glaſs Bubble, with as much *Aqua Regia* impregnated with Gold, as was equal to ſomething more than a great Pins head, and ſet it over ſuch a ſtrong Fire, that both the Glaſs and Gold were upon the melting, then viewing the Glaſs I ſaw very plainly that a ſmall portion of the ſaid Gold was Coagulated into Branches, and that theſe Coagulated Particles were round knobs or bubbles.

Theſe Gold Bubbles were diſperſt in great numbers over the whole Glaſs,in ſome places cloſe together,in others thinner, of different magnitudes, and many of them ſo ſmall, that altho I view'd them thro a good Microſcope they did in a manner eſcape my ſight; inſomuch that it is almoſt impoſſible for a man to conceive, unleſs he has had ocular proof and demonſtration thereof, that ſuch vaſt numbers of Gold Globules could proceed from ſo ſmall a quantity of Matter, and who knows how many more Gold Particles muſt coaleſce in melting, to compoſe one of theſe ſmalleſt Globules.

Now tho the ſmall Gold Particles could not be diſcover'd when they were ſurrounded with *Aqua Regia,* we could eaſily ſee the ſhining Gold colour of them all, now (ſaving only the very ſmalleſt Globules) which was no unpleaſant ſight, for they all appeared like ſo many compleat round Pellets.

In my former Letter I affirm'd that that green ſtuff is found upon ſtill Waters (which we alſo call *Duck weed*) did not ſpring from the Ground, but from Seed within it.

But now in Winter, when thoſe Ditches, in which I had ſeen much of this green Weed, were covered with Ice, I ſaw but a very little of it, and what I ſaw was very ſmall of Leaf.

Having conſider'd this, I thought it might be poſſible in warm weather for thoſe green Weeds to ſpring from the Earth, tho it did not feed upon the Ground, nor encreaſe in bigneſs there.

For ſuppoſing as it really happens, that theſe Weeds in warm Weather by the rarefaction of thoſe Particles of Air in their Veſſels are driven up to the ſuperficies of the Water, the ſame Weeds by the contraction of the Air in cold Weather will grow heavier than the Water, and conſequently ſink to the bottom, and according to the change of the Weather, will have their viciſſitudes of emerging or ſubſiding.

This riſing and falling of the green Weeds may ſeem ſtrange to ſome people, but if they will be convinced by the Experiments of natural Philoſophers whom I have followed ſeveral years, let them take a ſmall Glaſs-bubble, ſuch as is deſcrib'd by Fig 10. Q R S T, leaving the ſmall orifice at T open for the Water to run in and out, and let this Bubble be put into a Veſſel with Water, they will find in Summer that by the dilation of the Particles of Air within the ſaid Bubble, it will riſe to the ſuperficies of the Water, whereas the ſame Air, thro its elaſticity, being contracted in cold Weather, will make room for the admiſſion of a Maſs of Water ſo much heavier than itſelf into the ſaid Bubble, and then it will ſubſide; and this will happen *toties quoties.*

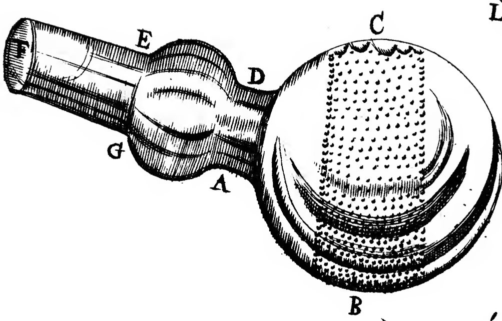
IV. *A Letter from the Reverend Mr* William Derham, F. R. S. *to Mr* John Haughton, F. R. S. *containing his Obſervations on the Weather, &c. for ſome years laſt paſt.*

Upminſter, April the 5th, 1703.

I Lately ſent my Weather and Tables of laſt year to Dr *Sloane*, and promis'd when I ſhould hear from Mr *Towneley* in *Lancaſhire*, an Account of what he wrote that was curious: I have lately receiv'd Mr *Towneley*'s Letter, and take the occaſion of that Letter to write now to you, to give you my hearty thanks for all favours that I have receiv'd from you; as well as to ſend you ſome of that ingenious, curious Gentleman's Obſervations of laſt year, and my own.

And firſt, As to the moſt remarkable Weather, eſpecially Rain, of laſt year, and the effects thereof: Mr *Towneley* tells me, that it is a general complaint in the North of *England*, philos·Transact N:286·

fig:4:a



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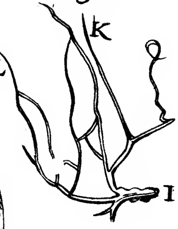

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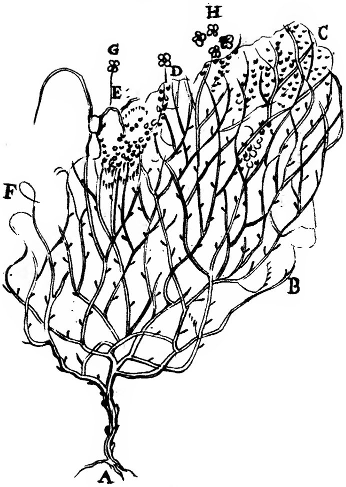

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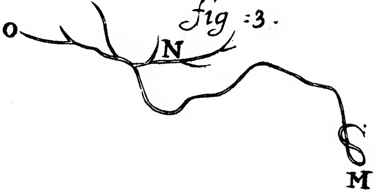

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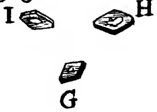

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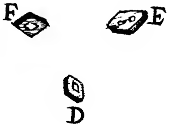

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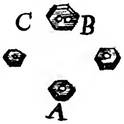

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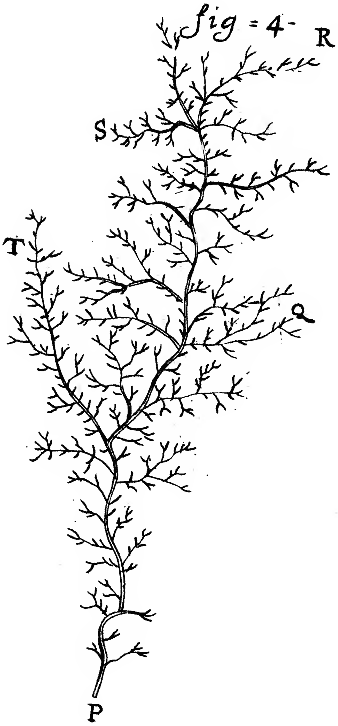

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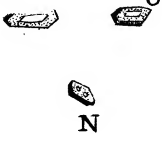

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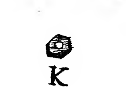

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